A metrological approach to evaluate epidemiological forecasting models

TOPIC: _Metrolog. traceability/Measurement uncertainty Presentation preference: **O** [X] **P** [ ] **I** [ ]

A metrological approach to evaluate epidemiological forecasting models

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Abstract: The evolve of the vineyard diseases, such as Grapevine Downy Mildew (*Plasmopara viticola*), are strictly depending by temperature, humidity and rain. The pathology is currently controlled with the massive use of fungicides, which has considerable economic costs, negative effects on environment, human health and wine quality.

For a correct defense against pathogen attacks, it is necessary to know the incubation period to act promptly and reduce the use of chemicals. In order to identify high-risk and fungicide sprays periods, several forecasting models have been proposed. These are useful tools which may assist in agricultural management risks and require accurate knowledge of meteorological variables such as temperature, humidity and precipitation. To date, the models used have improved the quality of the output data, but none of them considered the quality of the input data in terms of evaluation of measurement uncertainty and traceability of the sensors of the weather stations.

In situ calibration of weather stations installed in agricultural sites is usually performed by comparison. This procedure was metrologically evaluated and showed relevant weak points. Standard sensors are not always made to operate in open air, it is not possible to cover the whole range for the quantities, thus it is not possible to evaluate linearity and uncertainties for several sensors over the whole range and the evaluation of the mutual influences between parameters is not achievable. A calibration procedure for automatic weather stations for agrometeorological scope is proposed.

The aims of this study, part of the European MeteoMet project, are the improvement of the meteorological observations in field by disseminating the calibration methods, the implementation of traceability in agrometeorological measurements, and the improvement of the forecasting models by inclusion of traceable data and uncertainty components in the input values in order to reduce the use of chemicals in viticulture.